Guidance For Guardrail Design Applications

Date: June 7, 2005

Energy Absorbing Guardrail Terminal Platform Grading

1. The purpose of the guardrail terminal platform is to reproduce to the extent practical the physical conditions under which the terminal unit was tested for its NCHRP 350 test level certification.

2. The grading of the platform (from the platform's edge *perpendicular* to the roadway) must not be any steeper than a 4:1 slope even if it requires grading down to the toe of the slope. (See EAGRT platform details) This is to minimize the possibility of inducing lateral (side to side) instability to an errant vehicle.

3. The algebraic difference of the approach grade (from the platform's edge *parallel* to the roadway slopes) compared to either the platform's grade or the slope the approach grade ties into, must not exceed 10%. This is to minimize the possibility of inducing longitudinal (front to back) instability to the errant vehicle.

4. The above criteria are to allow the vehicle to remain stable if it leaves the pavement. It is essential that the approach grading for the platform blend smoothly from its edge to the roadway slope. **In no circumstance should the design of the platform be compromised such that the platform itself could induce instability to the errant vehicle.**

5. The "minimum acceptable design*"* for guardrail platforms without actually constructing a platform is to provide smooth grading with 4:1 or flatter slopes perpendicular to the roadway approaching, adjacent to, and behind the terminal for its entire length.

6. The "preferred design" should be used whenever possible and is *required* on roadways such as Interstates. For other types of roadways, if the preferred design cannot be accommodated due to right-of-way, environmental, or other constraints, then the "alternative design" should be used. If the constraints are still such that the "alternative design" cannot be accommodated, then the "minimum acceptable design" must be provided. The "minimum acceptable design" is only appropriate if the other platform designs cannot be provided.

Energy Absorbing Guardrail Terminal

EAGRTs should be tapered (25:1 and 50:1) for the appropriate speed condition to obtain a minimum of one foot offset from the edge of pavement to allow for the widths of the impact heads and to minimize nuisance hits, specifically from plow trucks. The specific tapers are the *maximum* allowed between standard rail and the EAGRTs for the specific lengths indicated. EAGRTs may also be used with a standard tapered rail application, but an 8% lateral platform slope should be extended through the length of the tapered section.

Guardrail Transitions from 30-inch Rail Height to Match to 27-inch High Guardrail Terminals and Bridge Approach Units.

There may be situations where standard beam guardrail, set at 30 inches high, will need to be connected to beam guardrail terminals that have only been crash tested at 27 inches high or bridge approach units that are designed at 27 inches high. This may reflect an existing or new installation. In those circumstances transition the height over 50 feet of the standard rail that is connected to the terminal or bridge approach unit (transition subsidiary to the 606 Items.)

The SKT 350 has been tested to allow a 30-inch height. The ELT, MELT, ET 2000, ET Plus, and the CRT have only been tested at 27-inch height.